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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/720,554	12/27/2000	Ayako Hohsaka	HOHSAKA-2	2522
7590 12/06/2005 Browdy & Neimark 624 Ninth Street NW Washington, DC 20001-5303			EXAMINER ANGEBRANNDT, MARTIN J	
			ART UNIT	PAPER NUMBER
			1756	

DATE MAILED: 12/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/720,554

Applicant(s)

HOHSAKA ET AL.

Examiner

Martin J. Angebrannt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 13, 15 and 16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13 and 15-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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1. The response of the applicant has been read and given careful consideration. Responses to the arguments of the applicant are presented after the first rejection to which they are directed. The rejection based solely upon Inagaki et al. '281 and Sato et al. '839 is withdrawn as neither of these references discuss the reflectivity. The rejection of paragraph 7 of the previous office action is obviated. As well. The rejection based in parts upon Ootaguro et al. '882 and Yanagisawa is withdrawn as the claims no longer describe a light stabilizer, rendering this line of rejection superfluous.

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 13 and 15-16 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Elements critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

To achieve the recited reflectivity, the recording medium needs a reflective layer (see example 5 on pages 31-32 of the instant specification which use a silver reflective layer and on page 14 which ascribes high reflectivity to the reflective layer. Please bear in mind that the specification specifically states that the dyes absorb at 780 nm on pages 4 and 34 of the instant specification.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 13 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al JP 03-142281, in view of Sato et al. '839.

Kobayashi et al JP 03-142281 teaches optical recording media with reflectivities of 70 and 72 % . (table 3, leftmost column) using asymmetric dye I-1, an Au reflective layer and a UV cured protective layer (page 10/upper right and lower left columns). (table 1). The recording and readout uses 708 nm lasers. Useful reflective layer materials are disclosed. (page 4/upper right column). Useful counterions are disclosed. (page 4/upper left column). Dyes I-22 and I-23 use i-butyl substituents and either trifluoromethane sulfonic acid or p-toluenesulfonic acid as counterions. (the examiner had a spot translation of this reference, if the applicant has a translation made, the examiner would appreciate a copy with the next response.)

Sato et al. '839 teaches the use of compounds embraced by formula (I), where the benzene nuclei may be condensed with one or more benzene rings or may be substituted by various moieties. (3/18-24) the number of methine groups is 5 when n is 2 (2/64). The anions may be any acid anions including halogens, and  $\text{SbF}_6^-$ . (2/65-67). The N-alkyl groups are different with  $\text{R}_5$  being a  $\text{C}_{1-3}$  alkyl group and  $\text{R}_6$  being a  $\text{C}_{3-18}$  alkyl group. This asymmetry is disclosed as improving the stability, solubility and the like. (4/20-30 and 2/10-15). The equivalence in the various terminal moieties is found in 3/24-25. The equivalence of heptamethine and pentamethine chains based upon the disclosure of n being equal to 2 or 3 (2/65). The equivalence in the various anions is found in 2/65-67. The addition of stabilizers,

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including the aminium/immonium compounds shown in column 22, and metal complexes such as biphenyldithiols and others to improve the stability of the recording medium and having compatibility with the cyanine dyes. (21/49-23/35). These may be used in amounts of 0.02- 1 mole/ mole of cyanine dyes (23/30). The use of Zn, Cu, S, Ni, Cr, Ge, Se, Ag and Al for providing improved reflectance is disclosed. (24/20-25)

It would have been obvious to one skilled in the art to modify the examples of Kobayashi et al JP 03-142281 by using other exemplified asymmetric dyes such as I-22 or I-23 with a reasonable expectation of forming a useful optical recording medium with reflectivities near 70% with direction to the exemplified asymmetric dyes provided by Sato et al. '839 based upon the increased solubility and stability ascribed to asymmetric dyes by Sato et al. '839. Further, it would have been obvious the result medium by using other disclosed counterions such as  $\text{CH}_3\text{COO}^-$ ,  $\text{CH}_3\text{SO}_4^-$ ,  $\text{CF}_3\text{COO}^-$ ,  $\text{HSO}_4^-$ , etc disclosed in place of the  $\text{CF}_3\text{SO}_3^-$  or p-toluene sulfonic acid with a reasonable expectation forming a useful optical recording medium based upon the disclosure of equivalence.

6. Claims 13 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al JP 03-142281, in view of Sato et al. '839 and Inagaki et al. '281.

Inagaki et al. '281 teach the use of compounds embraced by the formula (1), which includes linking groups such as those of formula (b) in column 3. The substituents Y **independently** may be hydrogen, alkyl groups, and halogens. (4/21-32). Benzoindoleneic terminal moieties are taught as evidenced by compounds 14 and 15 in columns 7 and 8. The use of the  $\text{PF}_6^-$  anion is disclosed as resulting in increased stability, has good solubility and is free from the danger of explosion. (1/65-2/4). The dyes disclosed are all symmetric. The disclosure

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of the addition of singlet oxygen quenchers to enhance the readout durability of the medium is disclosed. Specific examples include transition metal complexes (9/8-12/41 and 13/33-14/28, particularly 9/8-25) useful in amounts of 0.05-12 moles/mole of cyanine dyes. (14/33-35) The use of reflective layers is described (15/38-40)

In addition to the basis provided above the examiner holds that it would have been obvious to modify the optical recording media of Kobayashi et al JP 03-142281 and Sato et al. '839 by using similar cyanine dyes having meso substitution of the chain as taught by Inagaki et al. '281 with a reasonable expectation of forming useful optical recording with high reflectivity, noting that the R1 independently may be alkyl moieties.

7. Claims 13 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morishima et al. '772, in view of Inagaki et al. '281 and/or Saito et al. '089 combined with Sato et al. '839.

Morishima et al. '772 teaches the use of cyanine dyes embraced by the formula (B-1) in column 26, where the linking group is a pentamethine linkage optionally substituted with alkyl or halogen moieties and the Z moieties may be naphthalene residues and the N-substituents may be the same or different. (26/11-21). The dyes B-3, B-14 and B-10, in example 7 is a symmetric pentamethine benzoindolenic dye having a  $\text{PF}_6^-$  anion as the counterion. The use of fluorine as the anion is also disclosed. (24/66). Dyes B-24, B-25. The combination of these dyes with other dyes including nitroso and diimmonium dyes (37/57-58). The use of tetracyanoquinonodimethane stabilizers is disclosed throughout. The use of metal chelate, diimmonium salts, nitroso compounds (such as those disclosed in JP 02-300287 and 02-300288) in amounts of 1-100 parts by weight based upon 100 parts weight of the dyes. (21/53-22/12).

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The groups R4 and R5 may be straight, branched or cyclic alkyl groups. (24/31-33). The use of various metals for reflective layers including Au, Ag, Cu, Pt, Al, Col, Sn, Ni, Fe or Cr to enhance reflectivity is disclosed (40/15-33). The reflectivity should be as high as 80% to allow replay in commercial CD players (40/59-67).

Saito et al. '089 teach that the use of the  $\text{PF}_6^-$  anion as the counterion increases the thermal decomposition temperature of the cyanine dye relative to the perchlorate ion. (table 3, Col. 22). This translates to increased resistance to fading of the dye due to heat or light, increased writing sensitivity and high C/N values. The use of stabilizers to improve the resistance to light fading including metal complexes such as PA 1005, 1006, and 1001, bisdithiol nickel complexes such as NKX-114 and dimmonium type compounds is disclosed. (23/54-66).

It would have been obvious to modify the dyes B-25 and B-26 of Morishima et al. '772 by using the  $\text{PF}_6^-$  anion as the counterion as taught by Inagaki et al. '281 and/or Saito et al. '089 with a reasonable expectation of improving the stability of the resultant medium with respect to heat and light based upon the teachings of Inagaki et al. '281 and/or Saito et al. '089 and using different different N-substituents on the benzoindoleneic moieties based upon the teachings of Sato et al. '839 with a reasonable expectation of achieving the increases in solubility, stability and the like as this is attributed to the asymmetry in the N-substituents and and further it would have been obvious to one skilled in the art to use the disclosed metal complex , tetracyanoquinodimethane, nitroso or diimmonium stabilizers in amounts disclosed as preferred by Morishima et al. '772, Sato et al. '839, Inagaki et al. '281 and/or Sato et al. '839 with a reasonable expectation of gaining the improvements in stability ascribed to them.

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The applicant is correct in that the reflectivity is not taught. The addition of reflective layers to increase the reflectivity of optical recording media is recognized in Inagaki et al. '281 and Sato et al. '839 with Morishima et al. '772 additionally stating that high reflectivities of near 80% allow the media to be read with commercial CD players, which is clearly a desirable advantage. The examiner maintains the same position with respect to the solubility benefit is attributed in the Sato et al. reference to the asymmetry. Even merely being more soluble than equivalent compounds with the same N- substituents would be sufficiently desirable. The examiner notes that there is comparative data establishing improved stability. The applicant's position with regard to data not being shown (ie. no proof) in the Sato et al. references is entirely untenable as the applicant is relying upon the same asymmetry recognized by Sato et al. as increasing solubility to gain this same benefit. The applicant's reasons for using the hexafluorophosphoric acid anions (page 3 at lines 2-7) are the same as those taught in Inagaki et al. '281 and Saito et al. '089. The solubility disclosed by Sato et al. '839 is the same issue as discussed in the instant specification on page 9 at lines 1-7 as well as on pages 29-31 with respect to table 2. **Therefore the desired results (increased stability and solubility; increased resistance to fading of the dye due to heat or light, increased writing sensitivity and high C/N values, increased stability, has good solubility and is free from the danger of explosion) and the same means as disclosed in the instant application (different N substituents and the use of PF<sub>6</sub> as the anion) for achieving them are already appreciated in the prior art and therefore cannot be interpreted as unexpected.**



While the teachings of the N substituents by Sato et al. '839 is not limited to n-alkyl moieties, it may be that the use of the branched alkyl moieties (ie. iso, sec ...) glean a larger benefit than similar n-alkyl moieties, which is not appreciated in the prior art. The applicant may wish to explore this silence within the art, amend the claims to be limited to branched alkyl moieties for R<sub>2</sub> and submit declaration evidence supporting a position that these have unappreciated properties/benefits, rather than confronting what is already appreciated in the art. The closest exemplified compounds of Sato et al. '839 are compounds 5 and 10, which use dodecyl and octyl alkanes as the longer N moieties and would be expected to benefit from the teachings of Inagaki et al. '281, who uses the simpler to make symmetric dyes. Currently in the instant specification compounds of chemical formulae 2 and 7 use the n-butyl, chemical formula 3 uses the i-butyl, chemical formula 8 uses the i-pentyl, chemical formula 4 uses the n-pentyl and chemical formula 6 is similar to compound 10 of Sato et al., so the applicant may already have some data on hand for the declaration. The declaration should be commensurate in scope with the coverage sought (ie examples with meso substitution should also be present).

8. Claims 13 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morishima et al. '772, in view of Inagaki et al. '281 and/or Saito et al. '089 combined with Sato et al. '839, further in view of Hamer, F.M., "The Cyanine Dyes and Related Compounds" (1964) pp. 200-243 and Dickerson et al. '447.

Hamer, F.M., "The Cyanine Dyes and Related Compounds" (1964) pp. 200-243 teaches various methods for making unsymmetrical cyanine dyes including that describing the reaction

of compound (II) on page 201 with quaternary salts of heterocyclic moieties having a reactive methyl group. (201-202). Pentamethine dyes disclosed as being formed in 1930 are disclosed as being meso substituted and therefore are easier to make. (page 200) These include bromo-meso and chloro-meso dyes (page 201).

Dickerson et al. '447 teaches that with pentamethine cyanine dyes, meso substitution is disclosed as promoting aggregation (12/2-8)

In addition to the basis provided above, the examiner cites Hamer, F.M., "The Cyanine Dyes and Related Compounds" (1964) pp. 200-243 and Dickerson et al. '447 to establish that the substitution of the meso position of pentamethine cyanine dyes is old and well known and that it is recognized as promoting aggregation of the dyes and holds that this further supports the obviousness of the combination of Morishima et al. '772, in view of Inagaki et al. '281 and/or Saito et al. '089 combined with Sato et al. '839 discussed above.

The applicant argues that optical recording were not known in 1964 and on that basis asserts that Hamer et al. is irrelevant. The applicant is correct that digital recording and laser addressed optical recording media were not invented by 1964 (silver halide photography was), but ease of manufacture of a particular dye is a desirable benefit and Hamer et al. speaks to that. Dickerson et al. discusses aggregation and the effect of meso substitution on it and solubility.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

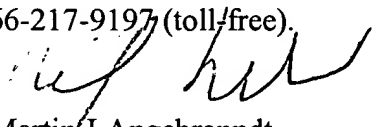
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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebrannndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Martin J Angebrannndt  
Primary Examiner  
Art Unit 1756

11/30/2005